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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/580,165	Applicant(s) LI ET AL.
	Examiner BABAR SARWAR	Art Unit 2617

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 25 May 2011.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-26 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO/SB/08)
 Paper No(s)/Mail Date _____

- 4) Interview Summary (PTO-413)
 Paper No(s)/Mail Date. _____.
- 5) Notice of Informal Patent Application
- 6) Other: _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 05/25/2011 have been fully considered but they are not persuasive.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the Examiner very kindly directs the Applicant to Hoppenstein e.g., ¶ [0001], ¶ [0021]-¶ [0022], ¶ [0028]-¶ [0029], ¶ [0031], and Figs. 3-4, that the object of Hoppenstein is to teach an active antenna array for use in a beamforming antenna system. The antenna array includes multicarrier power amplifiers coupled to each antenna element wherein the outputs of the multicarrier power amplifiers are linearized. The antenna array communicates with a base station control unit located at the base of the cellular tower in digital baseband. Fiber optic transmission lines couple the antenna arrays with the base station control unit. Multicarrier linear power amplifiers may be coupled to the antenna elements to linearize the outputs of the antenna elements. Alternatively, a predistortion circuit is coupled to the antenna elements to linearize the outputs of the antenna elements when multicarrier power amplifiers are used. On the other hand, In

an analogous field of endeavor, Lipka teaches that said band system including at least one base band chip, the at least one base band chip having a plurality of sectors (See Lipka e.g., the base band spreader unit for spreading the beams or sector signals for WCDMA of ¶ [0023]);.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teachings of Lipka to Hoppenstein for the purpose of efficiently performing power amplifier pooling in particular in a narrow beam or sectorized environment as suggested (See Lipka e.g., ¶ [0008]).

Hoppenstein in view of Lipka do not specifically teach when transmitting forward signals on a common channel, different beams are reflected to the sectors of the at least one base band chip to have different time delays in the base band system so that they are not coherent with one another even when different beams carry the same information.

In an analogous field of endeavor, Takeuchi teaches when transmitting forward signals on a common channel (See Takeuchi e.g., a plurality of antennas for sending a common channel by common beam, and sending dedicated channel by dedicated beam, i.e., the time delay exists, of ¶ [0008], Fig. 1), different beams are reflected to the sectors of the at least one base band chip to have different time delays in the base band system (See Takeuchi e.g., the timing for sending the common channel and the dedicated channels not overlapping with each other, i.e., having different time delays, common channel sending units, dedicated channel sending units of ¶ [0039], Figs. 2-3) so that they are not coherent with one another even when

different beams carry the same information (See Takeuchi e.g., sending dedicated traffic channels, dedicated pilot channels with different spreading codes (orthogonal codes) to reduce mutual interference of ¶ [0037], Fig. 2).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teachings of Hoppenstein, Lipka to Takeuchi for the purpose of reducing multi-pass interference between the common channel and the dedicated channel as suggested (See Takeuchi e.g., ¶ [0006]).

One cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. In re Keller, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); In re Merck & Co., Inc., 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Therefore, the previous rejection is maintained.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoppenstein (US Pub. No.:2004/0204109 A1) in view of Lipka (US Pub. No.: 2006/0040624 A1), and in further view of Takeuchi (US Pub. No.: 2002/0177468 A1) .

As per claims 1, 7, 12, Hoppenstein teaches a device for realizing beam-forming in CDMA system (See Hoppenstein e.g., utilization of the array elements, a beam

forming of ¶ [0022]): said device comprising in a forward signal flow, at least a base band system (See Hoppenstein e.g., digital baseband of ¶ [0021], Fig. 2 element 38), an optical transceiver system (See Hoppenstein e.g., optical interfaces, Transceivers of ¶ [0028], Figs. 3-4 elements 42 and 60), a transceiver system (See Hoppenstein e.g., the transceivers of ¶ [0028], Figs. 3-4 element 60), an analog fixed beam-forming network (See Hoppenstein e.g., the network of ¶ [0029], Fig. 4 element 22), a power amplifier (See Hoppenstein e.g., linear power amplifier of ¶ [0029], Fig. 4 element 78), a transmission filter at a radio frequency front end (See Hoppenstein e.g., filters of ¶ [0029], Fig. 4 element 80), and an antenna system (See Hoppenstein e.g., antenna, antenna elements of ¶ [0029], Fig. 4 elements 34, 70); said device comprising in a reverse signal flow, at least the antenna system (See Hoppenstein e.g., antenna, antenna elements of ¶ [0029], Fig. 4 elements 34, 70), a reception filter at a radio frequency front end (See Hoppenstein e.g., antenna, antenna elements of ¶ [0029], Fig. 4 element 70), a low noise amplifier (See Hoppenstein e.g., low noise power amplifier of ¶ [0031], Fig. 4 element 82), the analog fixed beam-forming network (See Hoppenstein e.g., the network of ¶ [0029], Fig. 4 element 22), the transceiver system (See Hoppenstein e.g., Transceivers of ¶ [0028], Figs. 3-4 element 60), the optical transceiver system and the base band system (See Hoppenstein e.g., optical interfaces, Transceivers of ¶ [0028], Figs. 3-4 elements 42 and 60); the optical transceiver system comprising an optical fiber and an optical interface board close to the base band system and an optical interface board close to the transceiver system (See Hoppenstein e.g., optical interfaces, Transceivers of ¶ [0028], Figs. 3-4 elements 42 and 60) and enabling

the base band system be placed in a warehouse so as to make the base band system support the plurality of sectors, and a radio frequency part close to the antenna, thereby reducing power loss (See Hoppenstein e.g., the base band system at the base of the tower or other support structure of ¶ [0001]).

Hoppenstein teaches that said optical interface board being used to interconvert electronic signals and optical signals input (See Hoppenstein e.g., interconverting electronic signals and optical signals input, optical interfaces of ¶ [0022] Figs. 2, and 4 element 42). However, Hoppenstein is silent about said band system including at least one base band chip, the at least one base band chip having a plurality of sectors.

In an analogous field of endeavor, Lipka teaches that said band system including at least one base band chip, the at least one base band chip having a plurality of sectors (See Lipka e.g., the base band spreader unit for spreading the beams or sector signals for WCDMA of ¶ [0023]):.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teachings of Lipka to Hoppenstein for the purpose of efficiently performing power amplifier pooling in particular in a narrow beam or sectorized environment as suggested (See Lipka e.g., ¶ [0008].

Hoppenstein in view of Lipka do not specifically teach when transmitting forward signals on a common channel, different beams are reflected to the sectors of the at least one base band chip to have different time delays in the base band system so that they are not coherent with one another even when different beams carry the same information.

In an analogous field of endeavor, Takeuchi teaches when transmitting forward signals on a common channel (See Takeuchi e.g., a plurality of antennas for sending a common channel by common beam, and sending dedicated channel by dedicated beam of ¶ [0008], Fig. 1), different beams are reflected to the sectors of the at least one base band chip to have different time delays in the base band system (See Takeuchi e.g., the timing for sending the common channel and the dedicated channels not overlapping with each other, i.e., having different time delays, common channel sending units, dedicated channel sending units of ¶ [0039], Figs. 2-3) so that they are not coherent with one another even when different beams carry the same information (See Takeuchi e.g., sending dedicated traffic channels, dedicated pilot channels with different spreading codes (orthogonal codes) to reduce mutual interference of ¶ [0037], Fig. 2).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teachings of Hoppenstein, Lipka to Takeuchi for the purpose of reducing multi-pass interference between the common channel and the dedicated channel as suggested (See Takeuchi e.g., ¶ [0006]).

As per claims 2, 8, 16, the combination teaches everything claimed as discussed in the rejected claims 1, 7, 12. In addition, Hoppenstein teaches wherein said base band system includes one base band logic (See Hoppenstein e.g., the base station controller in base band system of ¶ [0024], Fig. 2).

As per claims 3, 9, 13, 15, 7, 19, 23, 26, the combination teaches everything claimed as discussed in the rejected claims 1-2, 7-8, 12. In addition, Hoppenstein teaches that wherein in a device including the analog fixed beam-forming network (See

Hoppenstein e.g., the beam forming network of ¶ [0022], Figs. 2), when transmitting forward signals (See Hoppenstein e.g., the antenna elements performing both transmit and receive functions of ¶ [0025], Fig. 3), in order to avoid mutual counteraction between multiple beams forming a common channel, after the signals pass through the optical fiber, different beams pass different transceiver systems (See Hoppenstein e.g., the transceiver systems of ¶ [0028], Figs. 3-4), after passing their corresponding transceiver systems, the beams pass the analog fixed beam-forming network (See Hoppenstein e.g., the beam forming network of ¶ [0022], Figs. 2), and are amplified, filtered, and transmitted through antennas to former beams with different directions in space (See Hoppenstein e.g., linear power amplifier, the filters, the beams of ¶ [0025], ¶ [0029], Figs. 4, 6A-B).

As per claims 4,10, 20, 24, the combination teaches everything claimed as discussed in the rejected claims 1-2, 7-8. In addition, Hoppenstein teaches that wherein said device including the analog fixed beam-forming network needs to correct the analog fixed beam-forming network (See Hoppenstein e.g., the beam forming network of ¶ [0022], Figs. 2), the power amplifier, the transmission and reception (See Hoppenstein e.g., the antenna elements performing both transmit and receive functions of ¶ [0025], Figs. 3-4) filter of radio frequency front end, the low noise amplifier, a feedback and the antenna system, and radio frequency cables there between (See Hoppenstein e.g., linear power amplifier, the filters, the beams of ¶ [0025], ¶ [0029], Figs. 4, 6A-B).

As per claims 5, 21, the combination teaches everything claimed as discussed in the rejected claims 1-2. In addition, Hoppenstein teaches that wherein said analog fixed beam-forming network may be Butler matrix, or Blass matrix, or electromagnetic lens of the Lunegberg or Rotman type (See Lipka e.g., the matrix of WCDMA system ¶ [0030], Fig. 1).

As per claims 6, 11, 22, and 25, the combination teaches everything claimed as discussed in the rejected claims 1-2, 7-8, . In addition, Hoppenstein teaches that wherein said device comprises the base band system (See Hoppenstein e.g., the beam forming network of ¶ [0022], Figs. 2), the optical transceiver system, the transceiver system, an analog fixed beam-forming network formed by batter matrix (See Hoppenstein e.g., linear power amplifier, the filters, the beams of ¶ [0025], ¶ [0029], Figs. 4, 6A-B), radio frequency cables between the transceivers and the analog fixed beam-forming network, radio frequency links including the power amplifier, the transmission filter and the reception filter of radio frequency front end, the low noise amplifier and a feedback line, and the antenna system (See Hoppenstein e.g., the beam forming network of ¶ [0022], Figs. 2); said optical transceiver system, transceiver system, analog fixed beam-forming network, antenna system and radio frequency links (See Hoppenstein e.g., the transceiver systems of ¶ [0028], Figs. 3-4), there between can be placed on a tower or a holding pole so as to make the radio frequency cables there between as short as possible and easy to correct, therefore loss generated on outputting power in the power amplifier is reduced, and an area covered is increased. Outputs of each sector of said base band system pass the transceiver system

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respectively, then pass the analog fixed beam-forming network, and, thereafter, reflect to fixed beams respectively; beams formed in said common channel are equivalent to beams added by the fixed beams (See Hoppenstein e.g., the beam forming network of ¶ [0022], Figs. 2).

As per claim 14, the combination teaches everything claimed as discussed in the rejected claims 12. In addition, Takeuchi teaches that when transmitting in a traffic channel of a user, the transmitting can be made only within certain fixed beam where the user locates (See Takeuchi e.g., the dedicated beams of ¶ [0010], Figs. 2, 9), that is, the base band signals of the fixed beams for this user are reflected to one certain corresponding sector of the base band chips (See Takeuchi e.g., a dedicated channel sending units, the dedicated traffic channel and the dedicated pilot channel of ¶ [0010], Fig. 2), if the user locates among several beams, one or several narrow beams can be selected according to strengths of several user signals of beams received to transmit service data of the user (See Takeuchi e.g., adaptively forming the beam pattern corresponding to the change of the mobile station of ¶ [0009], Fig. 9), that is, the base band signals of the user is reflected to one or several corresponding sectors of the base band chips (See Takeuchi e.g., the beam pattern adaptation of ¶ [0009], Fig. 9).

As per claims 17, 18, the combination teaches everything claimed as discussed in the rejected claim 12. In addition, Takeuchi teaches wherein, in said step two: a quantity of the time delay is such that output signals of each sector of the base band chips do not correlate with one another when transmitting common channel information (See Takeuchi e.g., sending common channels, dedicated traffic channels, and dedicated

pilot channels with different spreading codes (orthogonal codes) to reduce mutual interference of ¶ [0037], Fig. 2).

Conclusion

3. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BABAR SARWAR whose telephone number is (571)270-5584. The examiner can normally be reached on MONDAY TO FRIDAY 09:00 A.M -05:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, NICK CORSARO can be reached on (571)272-7876. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/BABAR SARWAR/
Examiner, Art Unit 2617

/NICK CORSARO/
Supervisory Patent Examiner, Art Unit 2617